

ENVIRONMENTAL PROTECTION
LAND USE MANAGEMENT
LAND USE REGULATION PROGRAM

Notice of Revision and Updating of Freshwater Wetlands Technical Manual to
Incorporate Version 2.0 of the Landscape Maps

Take notice that the Department of Environmental Protection has revised and updated the Freshwater Wetlands Technical Manual in accordance with N.J.S.A 13:1D-111 et seq. Specifically, the Department has revised and updated the “Landscape Maps of Habitat for Endangered, Threatened and Other Priority Wildlife” (also known as “Landscape Maps” and “Landscape Project Maps”). The revisions are contained within the portion of the Freshwater Wetlands Technical Manual entitled "Protocols for the establishment of exceptional resource wetlands pursuant to the Freshwater Wetlands Protection Act (N.J.S.A. 13:9B-1 et seq.) based on documentation of state or Federal endangered or threatened species." Based upon the revisions and updates, the Department is replacing Version 1.0 with Version 2.0 of the Landscape Maps. The Freshwater Wetland Protection Act rules at N.J.A.C. 7:7A-2.4 (c) (Classification of freshwater wetlands by resource value) reference the Landscape Project Method and the technical manual. The Landscape Maps are also referenced in the Coastal Zone Management rules at N.J.A.C. 7:7E-3.38 and N.J.A.C. 7:7E-3C for purposes of the special area rule regarding endangered or threatened wildlife habitat and conducting an endangered or threatened wildlife habitat impact assessment.

The Department’s Landscape Maps generally depict “patches” of contiguous habitat types (forest, grassland, forested wetland, emergent wetland and beach/dune) and value the patches as habitat for endangered, threatened and priority wildlife species based upon their intersection with location data for any such species. Mapped habitat patches are classified based upon the status of the species present as follows:

- Rank 5 is assigned to patches containing one or more occurrences of at least one wildlife species listed as endangered or threatened on the federal list of endangered and threatened species.
- Rank 4 is assigned to patches with one or more occurrences of at least one State endangered species.
- Rank 3 is assigned to patches containing one or more occurrences of at least one State threatened species.
- Rank 2 is assigned to patches containing one or more occurrences of at least one non-listed State priority species (wildlife species that are considered by the Division to be species of special concern as determined by a panel of experts, and species of regional conservation concern as provided in regional conservation plans such as Partners in Flight Bird Conservation Plans, North American Waterbird Conservation Plan, United States Shorebird Conservation Plan, etc.).
- Rank 1 is assigned to patches that meet habitat-specific suitability requirements such as minimum size criteria for endangered, threatened or priority wildlife species, but that do not intersect with any confirmed occurrences of such species.

As with Version 1.0 of the Landscape Maps, the development of Version 2.0 was guided by consultation with an independent peer review committee that included experts on remote sensing, GIS mapping, and landscape ecology. All of the changes made between Version 1.0 to Version 2.0 were made either to correct errors in Version 1.0 or to improve the accuracy and reliability of habitat delineation and mapping.

Availability of Landscape Project Maps:

Landscape Project data is available via file download from the following locations:

- Division of Fish and Wildlife's website: www.njfishandwildlife.com or;
- Interactive ImapNJ website: <http://www.state.nj.us/dep/gis/imapnj/imapnj.htm>

or by contacting:

The Landscape Project
NJ Division of Fish and Wildlife
Endangered and Nongame Species Program
PO Box 400
Trenton, NJ 08625-0400
Phone:(609) 292-9400
Fax:(609) 984-1414

The following is a summary of the revisions and updates in Version 2.0 of the Landscape Maps:

1. Different base map. Version 1.0 of the Landscape Maps was based upon a 1994-95 land cover classification developed from LANDSAT satellite imagery by Rutgers University Center for Remote Sensing and Spatial Analysis (CRSSA). The revised and updated Landscape Maps (Version 2.0) are based upon the 1995/97 NJDEP land use – land cover (LULC) dataset derived from aerial photograph interpretation. Mapping resolution and precision of the NJDEP LULC maps is slightly improved in comparison with the CRSSA-derived maps.
2. Alteration to Bald eagle habitat. In both Version 1.0 and Version 2.0 of the Landscape Maps, the Department identified open water bald eagle (*Haliaeetus leucocephalus*) foraging habitat as follows. Open water areas are identified by locating, as closely as possible to each nest, sufficient open water areas to attain a total 660 hectares (1,631 acres). A 90-meter buffer is applied to the open water and all emergent wetland patches that intersect with the 90-meter buffer are located. The emergent wetland patches are merged with the open water areas to define the foraging habitat. The delineated foraging habitat (open water plus nearby emergent wetlands) is then buffered by 90-meters to include perching sites.

Version 1.0 of the Landscape Maps valued as bald eagle foraging habitat all patches of upland forest, forested wetland, emergent wetland and grassland that intersected the foraging habitat and perching site buffer described above, whereas Version 2.0 values as bald eagle foraging habitat only the delineated foraging habitat and 90-meter perching site buffer. By valuing entire patches, Version 1.0 included areas of forest and grassland areas that may not be used by foraging bald eagles. The change in Version 2.0 was made to limit the foraging habitat to those areas closest to open water, which are most relevant and critical to eagle foraging. As a result, Version 2.0 values significantly less area as bald eagle foraging habitat than Version 1.0.

3. Alteration to Peregrine falcon habitat. In Version 1.0 of the Landscape Maps, emergent wetland patches that intersected a 1-km radius area delineated around a peregrine falcon (*Falco peregrinus*) nest were valued as peregrine falcon habitat. In Version 2.0, peregrine falcon nests are separated into two types, urban and non-urban, depending on the type of landscape in which they are located. For urban nests a 1-km radius area around the nests is now valued as peregrine falcon habitat regardless of the land cover type. The fact that emergent wetland patches were the only habitat valued in Version 1.0 meant that urban peregrine falcon nests were not depicted on that version of the Landscape Maps where no emergent wetlands were present near the nest. The change in Version 2.0 was made to show the presence of urban peregrine falcon nests not shown on Version 1.0. The change also recognizes that peregrine falcons may use any habitats, including heavily built up areas, within 1 km of their nest area, especially in urban areas where primary prey items include pigeons and other birds common in urban landscapes. Non-urban nests continue to value only emergent wetland patches as they did in Version 1.0. As a result, Version 2.0 values more area as peregrine falcon habitat than Version 1.0.

4. Alteration to Wood turtle habitat. In both Version 2.0 and Version 1.0 of the Landscape maps the Department identifies all suitable stream segments within a 1610 meter (1 mile) radius of all documented wood turtle occurrences. A 322-meter (0.2-mile) buffer is applied to the identified stream segments. Stream segments and their buffers that fall greater than 1610 meters from any wood turtle occurrence are excluded from consideration. Next, the NJDEP LULC layer is overlaid on the buffered stream segments. All areas classified as urban, with the exception of power line corridors, are excluded from the buffers. Finally, the NJDEP Freshwater Wetlands layer is overlaid on the stream buffers. All wetlands areas that are within or contiguous with the buffered stream segments areas are identified and any portions of the identified wetlands greater than 1610 meters from any documented wood turtle occurrence are excluded.

The two principal differences between Version 1.0 and 2.0 are as follows: In Version 2.0 a larger set of streams was used than in Version 1.0. In Version 2.0 all DEP mapped streams, that is, all streams classified by DEP as 1st order or greater, are included, while in Version 1.0 a smaller set of streams, only streams classified by DEP as 2nd order and greater were included. This change was made based upon additional analysis following release of Version 1.0 which revealed that a large number of documented wood turtle occurrences were on DEP 1st order streams and that streams classified as 1st order by

DEP were suitable for wood turtles. In Version 2.0, only the identified wetlands together with the streams and stream buffers constitute wood turtle habitat, while in Version 1.0 any patches of upland forest, forested wetland, emergent wetland and grassland that intersected with the wetland and stream buffers were valued as wood turtle habitat. This change was made to limit the delineated habitat to those areas closest to suitable streams because the approach used in Version 1.0 included areas too distant from streams to be considered suitable for wood turtles. As a result of applying both of these changes, Version 2.0 values significantly less area as wood turtle habitat than Version 1.0.

5. Refinements in Pinelands Area. In Version 1.0 of the Landscape Maps, the land cover base map and the standard used to define suitable patches were the same throughout the state. In Version 2.0, two refinements are applied within the Pinelands Area (as defined by N.J.S.A. 13:18-1 et seq) that affect the way that forested areas (including both upland and wetland forest in the forest layer) are valued as habitat. This differential treatment within the Pinelands Area in Version 2.0 was imposed based on an analysis that indicated that Pinelands forest patches averaged more than 300% larger than forest patches in the rest of the state and more than 50% larger than the any other single Landscape Region. The larger forest patch size in the Pinelands results from the scarcity in the Pinelands of features, such as roads, that fragment forested areas into smaller patches. The larger average patch size in the Pinelands resulted in larger areas being valued by documented occurrences of endangered or threatened wildlife species in the Pinelands than in any other region. Modified interior area and corridor requirements in the Pinelands Area were applied to address this difference. Both changes tend to decrease average patch size and the total area valued by animal occurrences.

In the first refinement, the land cover base map is modified by applying a 91.44-meter (300-foot) minimum “corridor standard” to forest patches within the Pinelands Area. That is, areas of a patch that narrow to less than 91.44 meters in width, for a length of greater than 91.44 meters, are removed from consideration, and, as a result, the patch is separated into two or more smaller patches, instead of being considered as one. In Version 1.0 of the Landscape Maps (and in areas outside of the Pinelands Area in Version 2.0) no corridor standard is applied. Application of the corridor standard has the effect of increasing the number of individual forest patches and reducing the average size of forest patches on the land cover base map within the Pinelands Area in Version 2.0. The area valued as endangered and threatened species habitat is also reduced because fewer mapped species occurrences intersect with the smaller patches of suitable land cover types.

The second refinement, related to the forested land cover type, involves a modification to the minimum “interior forest area” requirement that applies to selected area-sensitive species throughout the state. The 10-hectare (24.7 acre) interior forest area requirement specifies that a forest patch is considered suitable for area-sensitive species only when the patch contains a total of 10 hectares or more of “interior” forest (sections of forest greater than 90 meters [295.3 feet] from the outside edge of the forest patch taken as a whole). A single patch of forest may contain several discrete interior forest sections and in Version 1.0 the interior forest area requirement for any patch is satisfied where the sum of all

separate interior forest sections within a single patch equals or exceeds 10 hectares. In Version 2.0, the application of the interior forest area requirement is modified in the Pinelands Area where a single forest patch must contain at least one interior forest section measuring at least 10 hectares in size. This refinement decreases the area of forest valued as habitat for endangered or threatened species by decreasing the number of forest patches that are valued by area-sensitive species.

6. Additional Documented Occurrences. In Version 2.0 of the Landscape Maps, the Department has added approximately 2,000 documented occurrences of endangered, threatened and priority species, not available for consideration in Version 1.0. These include 7 colonies of long-legged wading birds located on islands in the New York Harbor waterways within 10 miles of New Jersey. These nesting colonies included occurrences of two state threatened species, the yellow-crowned night-heron (*Nyctanassa violacea*) and the black-crowned night heron (*Nycticorax nycticorax*), along with several other species of herons and egrets considered “special concern.” Nesting locations in New York are included in New Jersey data because the nesting locations are close enough that suitable foraging habitat in New Jersey is used by these breeding birds. In addition, 14 New Jersey inland nesting locations not previously mapped for these two species were included in Version 2.0.

Additionally, six species listed as endangered or threatened and a group of species considered “special concern” that were not listed at the time that Version 1.0 was released were mapped. They are: Silver-bordered Fritillary (*Bolaria selene myrina*), Appalachian Grizzled Skipper (*Pyrgus wyandot*), Arogos Skipper (*Atrytone arogos arogos*), Bronze Copper (*Lycaena hyllus*), Checkered White (*Pontia protodice*), and Frosted Elfin (*Callophrys irus*). The addition of these species has been used to value Landscape Map patches according to the following:

A Silver-bordered fritillary: Occurrences value emergent wetland, grassland, forest and forested wetland patches.

Appalachian grizzled skipper: Occurrences value emergent wetland, grassland, forest and forested wetland patches.

Arogos skipper: Occurrences value emergent wetland, grassland, forest and forested wetland patches.

Bronze copper: Occurrences value emergent wetland, grassland, forest and forested wetland patches.

Checkered white: Occurrences value emergent wetland, grassland, forest and forested wetland patches.

Frosted elfin: Occurrences value emergent wetland, grassland, forest and forested wetland patches.

Invertebrate species of special concern: Occurrences of any invertebrate species listed as a species of special concern value the emergent wetland, grassland, forest and forested wetland patch in which they occur.

7. Other Changes. The following minor changes were made in the way in which documented occurrences value patches in Version 2.0 of the Landscape maps. Each of these changes was made to correct errors in Version 1.0 or to improve the accuracy by which the maps depict habitat for each of the following species:

Blue-spotted salamander (*Ambystoma laterale*): Version 1.0 of the Landscape Maps valued forest and forested wetland patches. Version 2.0 values forest, forested wetland and emergent wetland patches.

Bobolink (*Dolichonyx oryzivorus*): This species was incorrectly ranked in version 1.0 of the Landscape Maps as rank 4 (state endangered species). Version 2.0 ranks it correctly as 3 (state threatened species).

Bog turtle (*Clemmys muhlenbergii*): Version 2.0 of the Landscape Maps is based on a revised Bog Turtle model. The previous model was based on hand-mapped bog turtle population boundaries. The new model is based on selected DEP Freshwater wetland polygons. Also, in Version 1.0, Bog Turtles valued forested wetland, emergent wetland and grassland patches. In Version 2.0 bog turtles value emergent wetland and forested wetland patches.

Cooper's hawk (*Accipiter cooperii*): Version 1.0 of the Landscape Maps included no buffer on documented occurrences. Version 2.0 adds a 300-meter (984-foot) buffer to documented occurrences.

Cope's gray treefrog (*Hyla chrysocelis*): Version 1.0 of the Landscape Maps valued forest and forested wetland patches. Version 2.0 values forest, forested wetland and emergent wetland patches.

Eastern tiger salamander (*Ambystoma tigrinum*): Version 1.0 of the Landscape Maps valued forest and forested wetland patches. Version 2.0 values forest, forested wetland and emergent wetland patches.

Long-tailed salamander (*Eurycea longicauda*): Version 1.0 of the Landscape Maps valued forested wetland patches. Version 2.0 values forested wetland, emergent wetland and forest patches.

Mitchell's satyr (*Neonympha m. mitchellii*): This species was not included in Version 1.0 of the Landscape Maps. Version 2.0 includes this species and occurrences value emergent wetland, grassland, forest and forested wetland patches.

Northern goshawk (*Accipiter gentiles*): Version 1.0 of the Landscape Maps included no buffer on documented occurrences. Version 2.0 adds a 300-meter (984-foot) buffer to documented occurrences.

Northern pine snake (*Pituophis m. melanoleucus*): Version 1.0 of the Landscape Maps included no buffer on documented occurrences and valued forest patches. Version 2.0 adds a 500 meter (1,640-foot) buffer to documented occurrences and values forest and grassland patches.

Osprey (*Pandion haliaetus*): Version 1.0 of the Landscape Maps included no buffer on documented occurrences. Version 2.0 adds a 300-meter (984-foot) buffer to documented occurrences.

Pine Barrens treefrog (*Hyla andersonii*): Version 1.0 of the Landscape Maps valued forest and forested wetland patches. Version 2.0 values forest, forested wetland and emergent wetland patches. In addition, the species ranking has changed from rank 4 in version 1.0 to a rank 3 in Version 2.0 due to a change in the listed status of the species from State Endangered to State Threatened.

Net Change in areas classified as Endangered or Threatened wildlife habitat:

As a result of all of the changes described above, Version 2.0 of the Landscape maps rank an additional approximately 24,686 hectares (61,000 acres) as 3, 4, or 5 compared with Version 1.0. The vast majority of this increase is due to the additional documented occurrences noted above and the change in the base map.

Original signed 1/20/04
DATE

Ernest P. Hahn
Assistant Commissioner